

A 55-year-old man presented with a massive asymptomatic bilateral eyelid edema, associated with skin induration, which appeared 13 months before (Fig. 1a–b). The patient had induration of the skin with bright papules on the neck, shoulders, back, and arms. He reported a history of diabetes mellitus, dating from 10 years, under treatment with hypoglycemic drugs, and hypertriglyceridemia, treated with omega-3 fatty acids and statins. Routine laboratory investigations showed a high level of blood glucose (350 mg/dl), triglycerides (1333 mg/dl), cholesterol (231 mg/dl), glycosylated hemoglobin (HBGLI 10.1%), and C-reactive protein (35 mg/ml). Other routine laboratory investigations, including liver and renal tests, urinalysis, muscle function studies, serum and urinary protein electrophoresis, thyroid functions tests, and immunoserology were within normal limits or negative. Ophthalmologic, otolaryngologic, and neurologic exams were normal. An electrocardiogram, a whole-body computed tomography, and a magnetic resonance imaging examination of the head did not reveal any abnormality. Hematoxylin and eosin staining of the skin biopsy specimen from the periorbital area revealed fibrosis and edema in the dermis with a perivascular and periadnexal infiltrate of lymphocytes. In addition, basophils and histiocytes were observed in the dermis (Fig. 1c). Alcian blue staining showed sparse deposits of mucin between collagen bundles. Histology of the skin from the neck showed a marked thickening of the collagen bundles and scleredema in the dermis (Fig. 1d).

Once the diagnosis of scleredema diabeticorum was confirmed, we prescribed treatment with oral corticosteroids (prednisone, 0.5 mg/kg daily) and insulin for 6 weeks with satisfactory improvement of the skin lesions. Surgical excision of the interested areas of the face will also be taken into consideration in case of relapse.

The etiology of scleredema diabeticorum is unknown, but a role of advanced glycation end-products in the pathogenesis of this disorder has been suggested.⁸ These products and their receptors affect the balance of cellular proliferation and apoptosis, which may favor a fibrotic process that is common during the repair of the diabetic wounds.⁹

The presence of scleredema diabeticorum may be underrecognized in patients affected by diabetes, although it ranges from 2.5 to 14%.¹⁰ There is no geographic or gender predominance. Generally, these patients present with poorly-controlled diabetes, as was the case in our patient, which is frequently complicated by diabetic retinopathy and neuropathy. Treatment of hyperglycemia could contribute to reduce the clinical severity of this skin disorder.⁶ Corticosteroids, methotrexate, UV light therapy, photopheresis, and radiation therapy could be considered treatments with potential for clinical improvement.¹⁰

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Investigation of superficial mycosis in cutaneous allergy patients using topical or systemic corticosteroids

Cutaneous allergies (CA) are a very frequent issue in the general population but still poorly understood with regard to their pathogenesis and risk factors. CA results from a complex interaction between dysfunction of the cutaneous barrier, dysregulation of the immune system, and environmental factors.¹ Glucocorticoids, either topically or systemically, are frequently used for the treatment of the CA but have the detrimental effect of increasing the risk of infections depending on the route of administration and potency of the

treatment.² Severe and extensive dermatophytosis caused by *Trichophyton rubrum* has been described in patients under steroid-induced immune suppression. While dermatophytoses usually respond well to appropriate antifungal treatment, in the cases we describe the antifungal treatment failed, and resolution of the mycosis was only achieved with steroid removal.³ On the other hand, onychomycosis is usually

difficult to eradicate and can relapse in up to 25–40% of patients.^{4,5} There are no data regarding the frequency of onychomycosis and tinea pedis in CA patients under steroid therapy. From October 2006 to June 2007, patients attending the Hospital das Clínicas de Faculdade de Medicina da Universidade de São Paulo (HCFMUSP), Dermatologic Allergy Outpatient Unit, were investigated for superficial fungal infections.

Table 1 General characteristics from patients

Group	General data		Suggestive superficial mycosis	Cutaneous Allergic Diseases	Basic Disease	Treatment with corticosteroids
	Gender	Age				
1. G1	M	55	Nail and feet	Atopic dermatitis	–	Topic
2. G1	M	51	Nail	Atopic dermatitis	–	Topic
3. G1	F	63	Nail and feet	Urticaria	Fibromyalgia/osteoporosis/diabetes mellitus/Hepatitis B and C	Systemic
4. G1	M	71	Nail and feet	Atopic dermatitis	SAH (systemic arterial hypertension)	Topic
5. G1	M	36	Nail	Atopic dermatitis	–	Topic
6. G1	M	42	Nail and feet	Atopic dermatitis	–	Topic
7. G1	M	48	Nail	Atopic dermatitis	–	Topic
8. G1	M	60	Nail and feet	Urticaria	SAH	Topic
9. G1	M	60	Feet	Atopic dermatitis/ Photoreactor erythroderma	Diabetes mellitus/pancreatitis/ osteoporosis	Systemic
10. G1	F	53	Nail and feet	Urticaria	Lentigo-junctional melanocytic nevus	Topic
11. G1	M	53	Nail and feet	Atopic dermatitis/ Photoreactor erythroderma	Osteoporosis	Systemic
12. G1	F	42	Nail	Dermographism Urticaria	–	Topic
13. G1	M	61	Feet	Atopic dermatitis/ Photoreactor erythroderma	SAH	Systemic
14. G1	F	63	Feet	Atopic dermatitis	Diabetes mellitus/SAH	Topic
15. G1	M	82	Nail and feet	Atopic dermatitis	Diabetes mellitus/SAH	Topic
16. G1	F	59	Nail	Urticaria	SAH/Hepatitis C	Topic
17. G1	M	46	Feet	Atopic dermatitis	–	Systemic

Group	General data		Absent superficial mycosis	Cutaneous Allergic Diseases	Basic Disease	Treatment with corticosteroids
	Gender	Age				
1. G2	M	61	Nail and feet	Atopic dermatitis	SAH	Topic
2. G2	F	60	Nail and feet	Urticaria	Peripheral vestibular disorders/subclinical hypothyroidism	Topic
3. G2	F	58	Nail and feet	Dermographism Urticaria	SAH	Topic
4. G2	M	73	Feet	Urticaria	SAH/Diabetes mellitus/hypothyroidism	Topic
5. G2	F	54	Feet	Atopic dermatitis	–	Topic
6. G2	F	77	Feet	Urticaria	Arrhythmia/osteoporosis/hypothyroidism	Topic
7. G2	M	66	Nail and feet	Photoreactor erythroderma	SAH/Diabetes mellitus	Systemic
8. G2	F	27	Feet	Urticaria	–	Topic
9. G2	F	63	Feet	Urticaria	Vitiligo, hypothyroidism	Topic
10. G2	F	55	Feet	Atopic dermatitis	SAH/rheumatoid arthritis	Systemic
11. G2	F	23	Feet	Urticaria	–	Systemic
12. G2	F	19	Feet	Urticaria	Rheumatoid arthritis	Systemic
13. G2	F	41	Feet	Urticaria	–	Systemic
14. G2	F	54	Feet	Urticaria	SAH/Asthma	Systemic
15. G2	F	57	Feet	Atopic dermatitis	Epilepsy, hirsutism, dysphagia	Systemic
16. G2	F	59	Feet	Atopic dermatitis	SAH	Systemic
17. G2	F	50	Feet	Urticaria	SAH/hypothyroidism	Topic
18. G2	M	60	Nail and feet	Atopic dermatitis	Diabetes mellitus	Systemic

Group	Mycological Diagnosis	
	Direct Exam	Culture
1. G1	Negative	Negative
2. G1	Negative	Negative
3. G1	Negative	Negative
4. G1	Positive	<i>N. dimidiatum</i> (1/2)
5. G1	Negative	Negative
6. G1	Negative	Negative
7. G1	Positive	<i>T. rubrum</i> (1)
		<i>Trichosporon</i> sp (1)
8. G1	Positive	<i>T. rubrum</i> (1/2)
9. G1	Positive	<i>T. rubrum</i> (2)
10. G1	Positive	Negative
11. G1	Positive	<i>T. rubrum</i> (1/2)
12. G1	Positive	<i>T. rubrum</i> (1)
13. G1	Negative	Negative
14. G1	Negative	Negative
15. G1	Negative	Negative
16. G1	Negative	Negative
17. G1	Positive	<i>T. rubrum</i> (2)

Table 2 Mycological diagnosis in both groups (G1 and G2)

Group	Mycological diagnosis	
	Direct Exam	Culture
1. G2	Positive	<i>N. hialinum</i> (1/2)
2. G2	Negative	Negative
3. G2	Positive	<i>C. tropicalis</i> (1/2)
4. G2	Negative	Negative
5. G2	Negative	Negative
6. G2	Negative	Negative
7. G2	Positive	<i>N. hialinum</i> (1/2)
8. G2	Negative	Negative
9. G2	Negative	Negative
10. G2	Positive	<i>T. mentagrophytes</i> (2)
		<i>T. asahii</i> (2)
11. G2	Positive	<i>T. mentagrophytes</i> (2)
12. G2	Negative	Negative
13. G2	Positive	<i>C. albicans</i> (2)
14. G2	Positive	<i>Trichosporon</i> sp (2)
15. G2	Positive	<i>T. rubrum</i> (2)
16. G2	Positive	<i>T. mentagrophytes</i> (2)
17. G2	Positive	<i>C. tropicalis</i> (2)
18. G2	Positive	Negative

G1: Individuals with lesion suggestive of fungal infection.

G2: Individuals without lesion suggestive of fungal infection.

(1): Direct exam or culture positive from nail.

(2): Direct exam or culture positive from interdigital skin.

All adult patients with an established skin allergy diagnosis and using topical or systemic corticosteroids were included; pregnancy was an exclusion criterion. The patients were examined for the presence of tinea pedis and/or onychomycosis. Samples from foot and/or subungual space were collected and submitted to mycological direct microscopic examination and culture. The patients were divided in three groups: G1: 17 patients with CA and a lesion suggestive of superficial fungal infection (FI); G2: 18 patients with CA but

no signs or symptoms suggestive of FI; and G3 (Control Group): 10 healthy volunteers without CA or lesions suggestive of FI. In the latter group, specimens were collected from the interdigital space. The samples were analyzed by microscopy after treatment with 10% potassium hydroxide and cultured on slant tubes of Sabouraud Agar and Mycobiotic Agar (Difco™). The diagnosis of onychomycosis due to nondermatophytes filamentous fungi (NDFF) was based on the following criteria: (i) nail abnormality consistent with

onychomycosis, (ii) positive KOH preparation: the presence of fungi in the nail keratin filaments, (iii) failure to isolate a dermatophyte culture, and (iv) the growth of NDFF on at least three successive occasions, with a minimum of 2-week intervals. The identification of the cultures of dermatophytes and NDFF were made through morphological characteristics, observation of the gross colony and lacto phenol-cotton blue microscopic examinations. Presumptive identification of *Candida* sp was done as per de Hoog *et al.*⁶ The patients were born or resided in São Paulo for more than 10 years, and they were using topical or systemic corticosteroids. The G1 group was comprised of patients mainly with atopic dermatitis (AD), followed by urticaria (70.6 and 29.4%, respectively), while the opposite was found in G2: 33.3% had AD and 61.1% urticaria (Table 1). The mycological examinations in G1 and G2 demonstrated 47.1 and 61.1% of positivity by direct examination, respectively, but a slightly lower percentage of patients (41.2 and 55.6%, respectively) had positive cultures (Table 2). Mycological exams were negative in all G3 individuals. Tinea pedis and onychomycosis were the main findings; dermatophytosis of other localizations was not found. We found that in the AD patients of G1, 41.7% presented onychomycosis and/or tinea pedis, while this occurred in 60% of the AD of G2. In the patients with urticaria, onychomycosis and/or tinea pedis was also frequent (83.3% in G1 and 45.5% in G2) (Tables 1 and 2). These figures are higher than those of Leibovici *et al.*,⁷ who found a prevalence of 8.4% of tinea pedis in 190 AD patients and those of Svejgaard and Nilsson⁸ who diagnosed onychomycosis in only 4.9% of the AD patients. In both G1 and G2, superficial mycoses were found predominantly in those over 50 years old (Table 1). Gupta *et al.*⁵ verified that older age was a risk factor for higher prevalence of onychomycosis in the general population. With regard to the causative dermatophyte, in G1 *T. rubrum* (75%) was the main agent, while in G2 *T. mentagrophytes* (27.2%) was the main agent. Other agents such as *Neoscytalidium* sp, *Trichosporon* sp, and *Candida* sp were also isolated. In allergic patients from G1 and G2 using topical corticosteroids, 29.4 and 16.7% of positivity were found in the mycological diagnosis, while those using systemic corticosteroids showed 23.5 and 63.6% of positivity in the mycological diagnosis (Tables 1 and 2). Treatment with drugs that suppress cell-mediated immunity, such as corticosteroids and other immunosuppressive agents, is recognized as a major predisposing factor for fungal disease.^{2,9} On the other hand, the treatment with steroids can cause some confusion because the resulting anti-inflammatory effect may attenuate and mask the cutaneous lesions, e.g., making tinea less scaly or the 'active' edge and the inactive center of the lesion less distinct (tinea incognito).¹⁰ We speculate that this may have happened in group G2. This preliminary study suggests that both topical and particularly systemic corticosteroid treatment are risk factors for the development of superficial mycosis in CA patients.

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A wake-up call to dermatologists – climate change affects the skin

Dear Editor,

Our planet is warming up at an accelerated pace, and with it global and regional climate patterns are changing.

The consequences for the health of human beings living on this warming planet are enormous and often catastrophic. Public health is at risk, and patterns of disease and human suffering are in evolution. This has been recognized in a recent consensus statement endorsed by more than 50 medical organizations.¹ The organizations representing dermatology were not among them.

Skin is impacted by climate change. Many dermatologic diseases become epidemics in the hot and wet conditions associated with climate change. Higher temperatures, rain, and flooding affect disease vectors, their hosts, and pathogens, leading to a change in the epidemiology of vector-borne diseases including Lyme disease, tularemia, Rocky Mountain spotted fever, Mediterranean spotted fever, dengue fever, malaria, West Nile virus, Ross River virus, Barmah Forest virus, and leishmaniasis.^{2,3} Prolonged exposure to floodwater after flooding increases the risk of skin infections and inflammatory skin disease.⁴ Flooding associated with climate change increases the risk of water-borne disease.⁵ Natural disasters such as flooding are often also associated with population migration: Displaced people living in camps are at risk of skin infections, xerosis, eczema, acne, and hair-related disease.⁶ Warm temperatures prolong the allergy seasons and worsen air pollution.⁷ High temperatures increase the risk of contracting hand, foot, and mouth disease.⁸ Environmental factors such as high temperature and sunlight may influence patterns of pemphigus vulgaris.⁹ Climatic factors play an important role in the onset of leg ulcers.¹⁰ Rising levels of carbon dioxide may increase the risk of getting contact dermatitis by poison ivy.⁷

The prevalence of atopic dermatitis has been increasing in developed world; climatic changes may have attributed to this.¹¹

Dermatology as a specialty needs to be involved with efforts to create awareness of and prevention of climate change, and in dealing with its consequences. Our organization, the International Society of Dermatology (ISD), is well positioned as an international organization in dermatology to take this lead. In many aspects, it is already. Awareness of the effect of climate change has been promoted through this journal.^{2,12} Dealing with the consequences of climate change is being achieved through many community-based dermatology programs supported by the ISD subcommittee *Skin Care for All: Community Dermatology*. This has included the initiation of the Regional Dermatology Training Center in Moshi, Tanzania, and the Regional Leishmaniasis Control Center (RLCC) in Yemen.¹³

The consequences of climate change will include epidemics of skin disease. The ISD should position itself as the lead medical organization advising on the prevention and effects of climate change and its impact on skin disease.

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